

## NOTEWORTHY VASCULAR PLANT COLLECTIONS ON THE KISATCHIE NATIONAL FOREST, LOUISIANA

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### ABSTRACT

Eighty plant species that are recognized as sensitive, threatened, or endangered by the Kisatchie National Forest or by the Louisiana Natural Heritage Program, or that are on the Louisiana Natural Heritage "watch list," are known to occur on the Kisatchie National Forest, Louisiana. Over the past few years, surveys have been undertaken by various botanists and ecologists to locate and census many of these species. The results add to the growing botanical knowledge of the West Gulf Coastal Plain.

**KEY WORDS:** Rare, threatened, endangered plants; Kisatchie National Forest; Louisiana; West Gulf Coastal Plain

### INTRODUCTION

Many authors have pointed out the relatively poor state of knowledge of the Louisiana and east Texas vascular flora (Thieret 1967b, 1968; MacRoberts 1984; Bridges & Orzell 1989a, 1989b). In 1967, Thieret stated that although there had been resident botanists in Louisiana for the past two hundred years "... the flora of Louisiana is probably the least known of any state in the union" (Thieret 1967b: v). Two decades later, Bridges & Orzell (1989a: 12) maintained that, although the general flora of the West Gulf Coastal Plain is fairly well known, "... more exploration of rare localized and specialized habitats is still needed in order to fully document the occurrence of plants which are very rare or restricted in their habitat preference ...."

The Kisatchie National Forest is located in western Louisiana in the center of the West Gulf Coastal Plain. Over the past few years, a number of surveys have been conducted of localized and specialized habitats on Forest Service land, one aim of which was to gather data on rare and specialized plant species. A large body of data on these species and their micro-distribution now exists, which should be made accessible in order to further the understanding of plant ecology in the West Gulf Coastal Plain.

Therefore, like Bridges & Orzell (1989a, 1989b) before us, we turn from the macro-distribution of species as reported in atlases or floras (MacRoberts 1989; Thomas & Allen 1993) to the micro-distribution in the existing landscape. Knowledge of locally rare species aids in pinpointing rare and vanishing habitat as well as

assessing the conservation value (rarity, diversity, and representativeness) of an area (Bourgeron *et al.* 1995).

This paper is based on our own surveys, on the rare species files of the Kisatchie National Forest and the Louisiana Natural Heritage Program, herbarium specimens, published papers, and unpublished reports. We include only data collected before 1995.

Since texts can be read in many ways, and since one of our reviewers mistook this to be an historical account, let us at the outset explain that our purpose is not historical but biogeographical. Our aim is not to provide a chronology of discovery and document collectors' priority on the Kisatchie National Forest, but to provide documentation for the occurrence of the taxa discussed. Consequently, we document occurrences emphasizing our own collections since we can vouch for them: we have had many vetted by experts and we know their provenance. Additionally, we emphasize the collections in the Kisatchie National Forest herbarium (SFRP) because we are most familiar with them. The history of botany and plant collecting in Louisiana and on the Kisatchie National Forest has yet to be written (MacRoberts 1984, 1989; Ewan 1967; Sundell 1979).

Unfortunately, only some plant communities on the Kisatchie National Forest have been systematically inventoried and censused, notably, bogs, glades, prairies, sandy woodlands, and sandstone outcrops. Consequently, information on rare species is biased in the direction of these communities. It is hoped that, in time, other communities will receive equal attention.

As in any endeavor like this, we keep turning up new records and finding mistakes in existing ones. But if we were to wait until all inconsistencies and mistakes are corrected and each report triple checked, nothing would get published. We provide the following account in the hope that future researchers will use it as a baseline to make emendations.

The Kisatchie National Forest consists of six districts that comprise about 242,000 hectares, or about two percent of Louisiana (Figure 1) (Caldwell 1991). The major community types in the Forest are upland longleaf pine forest, riparian forest, pine flatwoods/savannah, shortleaf pine/oak-hickory forest, and mixed hardwood-loblolly forest (Martin & Smith 1991, 1993). There are also many inclusion communities such as bogs, prairies, glades, outcrops, baygalls, and sandylands (Smith 1988; Smith *et al.* 1989; MacRoberts & MacRoberts 1993a, 1993b, 1993c, 1994, 1995; Martin & Smith 1991, 1993; Guillory *et al.* 1990). The majority of the plant survey work has been done on the Vernon, Kisatchie, and Winn districts. The Caney, Evangeline, and Catahoula districts have been relatively neglected except for brief surveys undertaken in 1993 and 1994 to examine some of their more promising habitats.

About half of the endangered, threatened, and sensitive plant species (ETS) on the Kisatchie National Forest are also on the threatened and endangered list for the Texas National Forests and Grasslands (Anon. 1994; Orzell 1990; Natural Heritage 1994).

There are two classes of plants reported on in this paper. The first are plants that are on both the Kisatchie National Forest ETS list and the Louisiana Natural Heritage "Rare Plants Species" list. The second are the Louisiana Natural Heritage "watch list" species. These are species that are of interest either because their distribution is imperfectly known or because they may be decreasing in numbers. For this work, we use the last 1994 Natural Heritage list dated "Nov. 1994." Because records on watch list species are not kept by the Forest Service, in the accounts that follow, information on them is more anecdotal and scanty than that on ETS species. We use Kartesz (1994) for nomenclature, adding synonyms where recent name changes could be confusing.

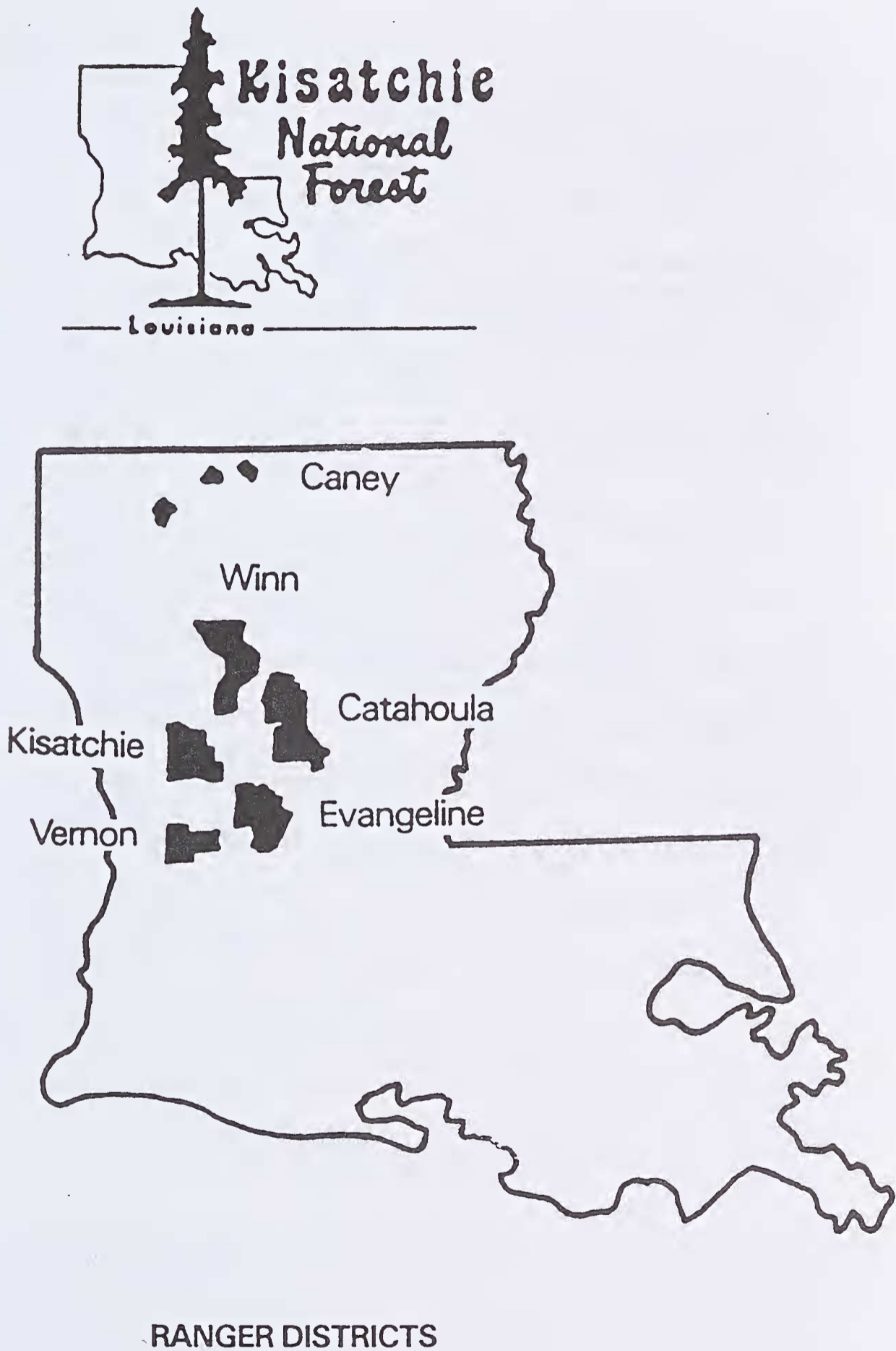


Figure 1. Locations of Ranger Districts in the Kisatchie National Forest.



Figure 2. Louisiana parishes.

We follow recent authors (*e.g.*, Bridges & Orzell 1989a) in giving detailed distributional information in order to make our data useful to present and future botanists interested in the plants and habitats; they need not borrow herbarium specimens, or more important in this case, try to locate the many site records that are presently scattered among many agencies, organizations, and individuals and which have no voucher specimens. However, we give only Township/Range/Section since this will suffice for most botanical/ecological needs and is general enough to discourage unscrupulous collectors.

In addition to Township/Range/Section, plant locations are given by Ranger District and Parish. For the sake of completeness, using the Louisiana Natural Heritage rare species list and other sources (*e.g.*, Larke & Smith 1994) we give the other parishes in Louisiana where the species is reported (Figure 2).

The following abbreviations are used:

KNF = Kisatchie National Forest

WGCP = West Gulf Coastal Plain (west Louisiana and east central Texas)

CatD = Catahoula District (Grant Parish)

CnyD = Caney District (Webster and Claiborne parishes)

ED = Evangeline District (Rapides Parish)

KD = Kisatchie District (Natchitoches Parish)

VD = Vernon District (Vernon Parish)

WD = Winn District (Natchitoches, Winn, and Grant parishes)

LAF = Herbarium, Department of Biology, University of Southwestern Louisiana, Lafayette, Louisiana

LSU = Herbarium, Department of Botany, Louisiana State University, Baton Rouge, Louisiana

LSUS = Herbarium, Biology Department, Louisiana State University, Shreveport, Louisiana

LTU = Herbarium, Biology Department, Louisiana Tech University, Ruston, Louisiana

NATC = Herbarium, Biology Department, Northwestern State University, Natchitoches, Louisiana

NLU = Herbarium, Biology Department, Northeast Louisiana University, Monroe, Louisiana

SFRP = Herbarium, Range Management Research, Southern Forest Experiment Station, U.S. Forest Service, Pineville, Louisiana

VDB = Herbarium, Botany Department, Vanderbilt University, Nashville, Tennessee

### SPECIES ACCOUNTS

*Amsonia ludoviciana* Vail. (*Martin* 364 [SFRP]; *MacRoberts & MacRoberts* 1578 [VDB], 1629, 2209 [SFRP]). Louisiana blue star is a near Louisiana endemic with its main populations centering on the KNF. It has been found at 21 sites in three districts: KD (Natchitoches Parish, nine sites, T5N R6W Sec. 29; T5N R7W Secs. 2, 14, 20, 21, 23, 37; T5N R8W Sec. 24), WD (Winn, Grant, and Natchitoches parishes, nine sites, T13N R5W Secs. 2, 29, 30; T12N R6W Sec. 1; T9N R3W Sec. 36), and CatD (Grant Parish, three sites, T8N R2W Secs. 16, 29; T8N R3W Sec. 1). It grows in wet areas such as roadside ditches and riparian forest (Lemke 1987; Larke & Smith 1994). The habitat in which this species occurs has not been the focus of any specific

survey on the KNF. Louisiana blue star is also reported from Allen, Bienville, Calcasieu, Red River, and Vernon parishes (Natural Heritage 1994).

*Asclepias stenophylla* A. Gray. (Urbatsch 4468 [LSU]). Narrow-leaved milkweed, a western species that reaches its eastern limit in Louisiana, is known from a single calcareous prairie on the WD (Winn Parish, T11N R4W Sec. 7). It was originally reported from Louisiana by Riddell in 1852 under the synonym *Aceretes angustifolia* (Nutt.) Dcne. (MacRoberts 1984, 1989) but not reported again until recently (S. Lynch, pers. comm.; Natural Heritage 1994).

*Asclepias viridiflora* Raf. (MacRoberts & MacRoberts 1730 [VDB], 2032, 2439 [SFRP]). This species is on the Louisiana Natural Heritage watch list. While we have not systematically kept records on its occurrence and the Forest Service does not monitor it, we have noted it regularly in calcareous prairies and calcareous soils in sandstone outcrops on the KD and WD (Natchitoches and Winn parishes) (MacRoberts & MacRoberts 1993c). It has been reported from scattered locations statewide (MacRoberts 1989).

*Astragalus crassicaarpus* Nutt. var. *trichocalyx* (Nutt.) Barneby. (Brown & Lenz 7620, 7617 [LSU]; Martin s.n. [LSU]; Thomas et al. 92314, 95456 [NLU]; Gilmore & Smith 3561 [LSU]). Ground-plum, a mid-central U.S. species, is known from four calcareous prairies in the WD (Winn Parish, T11N R4W Sec. 18; T11N R5W Secs. 13, 24, 26). It was first collected on the WD in 1939 by C.A. Brown and W. Lenz but was not correctly identified and was not relocated there until the mid-1980's (Smith et al. 1989; Lasseigne 1973; MacRoberts 1989). It has also been reported from Natchitoches and Cameron parishes (Natural Heritage 1994).

*Burmannia biflora* L. (MacRoberts & MacRoberts 2484 [SFRP]; Thomas 33333, 74027 [NLU]). Two locations for Northern Burmannia are known on the KNF. One is on the CatD (Grant Parish, T8N R1W Sec. 11) in a hillside wooded seep, the other is on the VD (Vernon Parish, T1N R6W Sec. 31) in riparian woodland. This is a southeastern and coastal plain species that is near the periphery of its range in the WGCP (Thomas 1970). It has also been reported from Bienville, DeSoto, Ouachita, and Webster parishes (Natural Heritage 1994).

*Calopogon barbatus* (Walt.) Ames. (Holmes 3007 [NATC]; MacRoberts & MacRoberts 304 [LSUS], 660 [VDB], 1917 [SFRP], 1610 [NLU]). We know of five locations for Bearded grass-pink on the KNF. Four are in the VD (Vernon Parish, T1S R8W Sec. 26; T1N R7W Sec. 29; and T1N R5W Sec. 20) and one is in the KD (Natchitoches Parish, T6N R7W Sec. 22). The KD site has been known since the 1970's (Holmes & Mathies 1980; MacRoberts & MacRoberts 1988). Four of the five populations occur in bogs and one is in the upslope mesic area above a bog (MacRoberts & MacRoberts 1993b; Hart & Lester 1993). This is a coastal plain species that reaches its western limits in the WGCP. It has also been reported from Allen, Jefferson Davis, and St. Tammany parishes (Natural Heritage 1994), but since it is likely that *C. barbatus* and *C. pallidus* Chapman could be confused, the published distributions of these species need verification (MacRoberts 1989; Thomas & Allen 1993a).

*Camassia scilloides* (Raf.) Cory. (Allen 17637 [NLU]; McInnis & Smith s.n. [LSU]). Wild hyacinth, an eastern species, has been found at two locations in the WD

(Winn Parish, T11N R5W Secs. 24, 35). It is a calcareous forest species (Larke & Smith 1994). It has also been reported from Bossier, Caddo, Natchitoches, and Webster parishes (Natural Heritage 1994).

*Carex hyalina* Boott. (Allen 17890 [NLU]). This species has been found at one location on the ED (Rapides Parish, T3N R2W Secs. 23, 25). It occurs in wet bottomland hardwoods (Thomas & Allen 1993b). It has only been recorded for Rapides Parish in Louisiana (Natural Heritage 1994).

*Carex meadii* Dewey. (MacRoberts & MacRoberts 1889, 2216 [VDB], 1903, 1924, 2186 [SFRP], 1889, 2289 [NLU], 1970 [LSU]). Mead's sedge, a widespread northern species, is known from five locations on the KD (Natchitoches Parish, T5N R6W sec. 4; T5N R7W Sec. 2; T6N R7W Sec. 35; T6N R8W Secs. 28, 29, 32; T5N R8W Sec. 1) and two locations on the WD, (Winn and Grant parishes T9N R2W Sec. 6; T12N R4W Sec. 34). It grows in sandstone outcrop communities and in calcareous prairies (Williams 1977; MacRoberts & MacRoberts 1993c). It is also reported from Acadia, Allen, and Jefferson Davis parishes (Natural Heritage 1994).

*Carex microdonta* Torrey & Hook. (MacRoberts & MacRoberts 1945, 2220 [VDB], 2215, 2220, 2284 [SFRP], 2272 [NLU], 2285, 2286 [LSU]). Small-toothed sedge, a species of the south central U.S., has been found at 20 sites on the WD (Winn and Grant parishes, T11N R4W Secs. 7, 8, 18; T11N R5W Secs. 13, 24, 25, 26, 35; T12N R4W Secs. 33, 34, 35; T9N R2W Secs. 5, 6). It is abundant in calcareous prairies. It has also been reported from Acadia, LaSalle, and Vernon parishes (Natural Heritage 1994).

*Carex tenax* Chapman. (MacRoberts & MacRoberts 2282 [VDB], 2295, 2296, 2339 [SFRP], 2294 [NLU], 2334 [LSU]). Strong sedge has been found at eighteen sites in KD (Natchitoches Parish, T7N R6W Sec. 64; T6N R6W Sec. 6; T6N R7W Secs. 1, 2, 4, 5, 9, 15, 16, 17, 18, 20, 21; T7N R7W Secs. 33, 34, 36) and three in WD (Natchitoches Parish, T13N R6W Secs. 7, 18) (MacRoberts & MacRoberts 1994). It occurs in upland xeric sandhill woodlands. It was for a long time known from only one site in Louisiana (Williams 1977; MacRoberts 1989). This species is also recorded from Vernon Parish (Thomas & Allen 1993a).

*Ceanothus herbaceous* Raf. (MacRoberts & MacRoberts 2018 [VDB]). Prairie redroot has been found in one calcareous prairie on the WD (Winn Parish, T11N R5W Sec. 13; T11N R4W Sec. 18). The only other Louisiana location is one calcareous prairie remnant in Caddo Parish (Natural Heritage 1994).

*Chamaelirium luteum* (L.) A. Gray. Fairy wand, an eastern species, has been found at one wooded seep on the KNF (WD, Natchitoches Parish, T13N R6W Sec. 8). The species was not collected because of its rarity and because there were only seven stems in the population. It has also been recorded from Lincoln, Ouachita, St. Helena, St. Tammany, Tangipahoa, Washington, and W. Feliciana parishes (Natural Heritage 1994).

*Cheilanthes lanosa* (Michx.) D.C. Eat. (MacRoberts & MacRoberts 2401 [VDB]; Thomas & Carroll 73889 & 2383 [SFRP]). Hairy lip-fern was first found on the KD, Natchitoches Parish, in the late 1930's (Brown & Correll 1942). It has been monitored over the years and still grows in the same place in crevices of sandstone

boulders in shaded upland longleaf pine forest (T6N R8W Sec. 27). While we have searched many boulders in the KNF for this species, it is still known only from the original locality. From earlier accounts, it apparently has become more restricted at the original location (Brown & Correll 1942; Thieret 1980). It is widespread in the eastern U.S.

*Cyperus grayioides* Mohlenbrock. (*MacRoberts & MacRoberts* 1801, 2072 [VDB], 1798, 2071 [SFRP], 2070 [NLU], 1803 [LSU]). Mohlenbrock's umbrella sedge has been collected many times in eastern Texas and western Louisiana. There are seven known sites for it on the KD (Natchitoches Parish, T6N R6W Sec. 6; T6N R7W Secs. 1, 2, 18, 21, 34; T6N R8W Sec. 21; T7N R7W Sec. 33), and four sites on the WD (Winn and Natchitoches parishes, T13N R7W Secs. 2, 11; T13N R6W Sec. 7; T13N R5W Sec. 32; T12N R5W Sec. 28). It grows in open areas in upland and stream terrace xeric sandhill woodlands (MacRoberts & MacRoberts 1994). It seems to be associated with deep sands especially in Illinois, Missouri, Texas, and Louisiana (Bridges & Orzell 1989a; Orzell 1990; Carter & Bryson 1991). In Louisiana it is recorded from Allen, Bienville, and Vernon parishes (Natural Heritage 1994).

*Cypripedium kentuckiense* C.F. Reed. Kentucky yellow lady's slipper occurs at scattered localities in the south central U.S. extending south into the WGCP. It has been reported from many northern parishes in Louisiana, but most records are relatively old (MacRoberts 1989; Thomas & Allen 1993a; Natural Heritage 1994). Its only known occurrences in the KNF are on the CatD (Grant Parish, one site, T9N R1W Sec. 32) and the ED (Rapides Parish, three sites, T2N R3W Secs. 11, 12). It occurs in mixed hardwood-loblolly forest and hardwood slope forest. Because of its extreme rarity, we photographed it rather than collect it.

*Dodecatheon meadia* L. (*MacRoberts & MacRoberts* 2240 [VDB,SFRP]). Shooting star has been found at one location on the KD (Natchitoches Parish, T5N R7W Sec. 14) in mixed hardwood-loblolly forest. It is a widespread northern species that reaches its southern limit in the WGCP. It is also reported from Bossier and Caddo parishes (Natural Heritage 1994).

*Draba cuneifolia* Nutt. ex Torrey & A. Gray. (*Brown* 5184 [LSU]). Wedge-leaf whitlow-grass is widely scattered through the south and central U.S. Brown collected it in 1934 in the vicinity of Goldonna, Louisiana. The herbarium label says "Goldiana [sic], La., Winn Parish," but Brown's field notebook says only "Goldiana" [sic], which is in Natchitoches Parish. And his notebook shows that on March 27 he had moved around a good bit collecting in both parishes. The exact habitat is also unclear: on the herbarium label it says "mixed hardwoods," but his notebook reads "roadside, mixed pine and hardwoods." The Natural Heritage data files record it as T12N R5W Sec. 28 assuming it was collected in Winn Parish. With this confusion, it is probably safe to say only that it was collected in the vicinity of Goldonna on a private inholding in the Winn District. This species is also known from Caddo Parish (Natural Heritage 1994).

*Eriocaulon texense* Körn. (*MacRoberts & MacRoberts* 1589 [VDB], 1579 [SFRP]). This species is on the Louisiana Natural Heritage watch list. While we have not kept precise records on its occurrence, we have found it only in VD (Vernon Parish) bogs where it can be plentiful (MacRoberts & MacRoberts 1993b). It is also reported from a few other west central parishes (MacRoberts 1989; Thomas & Allen 1993a).



*Eriogonum longifolium* Nutt. (*MacRoberts & MacRoberts 1800* [VDB], 1797 [SFRP]). Long-leaved wild buckwheat, a Great Plains species, is known from one stream terrace sandhill woodland in an inholding on the WD (Winn Parish, T12N R5W Secs. 28, 29). It is also reported from Caddo and Vernon parishes (Natural Heritage 1994).

*Eriogonum multiflorum* Benth. (*MacRoberts & MacRoberts 1808* [VDB], 1850, 2084 [SFRP], 1820 [NLU]). Many-flowered wild buckwheat, a species that ranges from northeast México to Oklahoma and western Louisiana, has been located at ten sites in two districts (WD, Winn and Natchitoches parishes, five sites, T13N R5W Secs. 7, 33; T13N R6W Secs. 2, 7; T13N R7W Secs. 2, 11; KD, Natchitoches Parish, five sites, T6N R6W Sec. 6; T6N R7W Secs. 5, 20; T7N R6W Sec. 64; T7N R7W Sec. 36). It grows in xeric sandhill woodlands. It also is reported from Bienville, Caddo, and Webster parishes (Natural Heritage 1994).

*Erythronium rostratum* W. Wolf. (*MacRoberts & MacRoberts 2169* [VDB], 2169, 2204 [SFRP], 2169 [LSU]). Yellow trout-lily, a species of the south central U.S., is on the Louisiana Natural Heritage watch list. We found it at one location in the ED (Rapides Parish) and two locations on the WD (Natchitoches Parish). It prefers riparian forest (Kral 1966). It has been found in a number of north Louisiana parishes (Thomas & Allen 1993a; MacRoberts 1989).

*Euphorbia bicolor* Engelm. & A. Gray. (*MacRoberts & MacRoberts 2415* [NLU], 2435 [SFRP]). This western prairie species, called snow-on-the-prairie, while common in Texas is rare in Louisiana and is on the Louisiana Natural Heritage watch list. It is known to occur in one WD (Winn Parish, T1N R4W Secs. 7, 8) calcareous prairie. It is also known from Vernon Parish (MacRoberts 1989).

*Evolvulus sericeus* Sw. (*MacRoberts & MacRoberts 1948* [VDB]). Creeping morning glory is on the Louisiana Natural Heritage watch list. While we have not regularly searched for it, we found it in sandstone outcrops on the KD (Natchitoches Parish, MacRoberts & MacRoberts 1993c). It has also been reported from a number of parishes in northeastern and southwestern Louisiana (MacRoberts 1989).

*Heliotropium tenellum* (Nutt.) Torrey. (*MacRoberts & MacRoberts 2019* [VDB], 2019, 2417 [SFRP]). Slender heliotrope, a calcareous prairie species of the south central U.S., has been found at fourteen sites on the WD (Winn and Grant parishes, T11N R4W Secs. 7, 18; T11N R5W Secs. 13, 24, 26; T9N R2W Secs. 5, 6, 7, 8) (Smith *et al.* 1989). It is also known from Vernon Parish (Natural Heritage 1994).

*Hexalectris spicata* (Walt.) Barnh. (*Rhodes 16606* [LTU]). Crested coral-root has been found once on the CnyD (Claiborne Parish, T23N R4W Sec. 34). Recent attempts to relocate these populations have failed. It is an uncommon but wide-ranging species extending across the southern United States to New Mexico and México. In our area it is found in mixed hardwood loblolly and hardwood slope forest (Larke & Smith 1994). It has also been reported from a number of central and north Louisiana parishes (Natural Heritage 1994; Thomas & Allen 1993a; MacRoberts 1989).

*Houstonia purpurea* L. var. *calycosa* A. Gray. [SY = *Hedyotis purpurea* (L.) Torrey & A. Gray var. *calycosa* (A. Gray) Fosberg]. (*MacRoberts & MacRoberts* 2206 [VDB], 2205, 2271, 2273 [SFRP], 2207 [LSU]). Purple bluet, a calcareous prairie species has been found at nineteen sites in the WD (Winn and Grant parishes, T9N R2W Secs. 5, 6; T11N R4W Secs. 7, 8, 18; T11N R5W Secs. 13, 23, 24, 26, 35; T12N R4W Secs. 33, 34, 35) (Smith *et al.* 1989; Martin & Smith 1991). It has also been reported from Bossier, Caddo, LaSalle, Caldwell, and Webster parishes (Natural Heritage 1994).

*Koeleria macrantha* (Ledeb.) J.A. Schultes. (*MacRoberts & MacRoberts* 2021a [VDB], 2440 [SFRP]). June grass, a widely distributed grass in North America, is known from three calcareous prairies on the WD (Winn Parish, T11N R4W Sec. 18; T11N R5W Secs. 13, 26). It is reported from no other parish (Smith *et al.* 1989; Allen 1992; Natural Heritage 1994).

*Lachnocaulon digynum* Körn. (*MacRoberts & MacRoberts* 531, 1776 [VDB], 1777B, 2471 [SFRP], 1470 [LSU]). Pineland bog buttons, a coastal plain species, was not reported for the WGCP until the late 1980's (Bridges & Orzell 1989a; MacRoberts 1989; Thomas & Allen 1993a). It has been found in one bog on the WD (Natchitoches Parish, T12N R6W Sec. 12) and in just over 50 bogs on the VD (Vernon Parish; there are so many widely scattered sites that we do not give locations here) (Hart & Lester 1993; MacRoberts & MacRoberts 1993b). It is also recorded from Beauregard, Sabine, St. Tammany, and Washington parishes (Natural Heritage 1994; MacRoberts 1989; Julia Larke, pers. comm.).

*Liatris tenuis* Shinnars. (*Grelen 1821* [NLU]). Slender gay-feather, a WGCP endemic, has been found at a single location on the VD (Vernon Parish, T1S R6W Sec. 6) in upland longleaf pine forest (Gandhi & Thomas 1989). It is also reported from Caddo, Calcasieu, DeSoto, Rapides, and Sabine parishes (Natural Heritage 1994).

*Lilium michauxii* Poir. (*MacRoberts & MacRoberts* 2457 [SFRP]). Carolina lily is on the Louisiana Natural Heritage watch list. It has not yet been carefully monitored. We have found it in a couple of beech-magnolia riparian forest areas on the KD (Natchitoches Parish). It is probably locally common but generally rare on the forest. It has been reported from a number of parishes in western and southeastern Louisiana (MacRoberts 1989; Thomas & Allen 1993a).

*Lithospermum caroliniense* (Walt. ex J.F. Gmel.) MacM. (*MacRoberts & MacRoberts* 2223 [SFRP]). Puccoon is on the Louisiana Natural Heritage watch list. It appears to be locally common in upland xeric sandhill woodlands and upland longleaf pine forest, notably on the KD (Natchitoches Parish) and WD (Natchitoches and Winn parishes) and in central and northwestern Louisiana (MacRoberts 1989).

*Lycopodiella cernua* (L.) Pichi Sermolli [SY = *Lycopodium cernuum* L.]. (*Holmes 3360* [NATC]; *Thomas 74133* [NLU]). Nodding clubmoss, a coastal plain species, has been found at only one site in the KNF. In the 1970's it was found in a bog on the KD (Natchitoches Parish, T6N R7W Sec. 22) (Thomas *et al.* 1978). While it apparently persisted at this location for a number of years, it has not been found there for more than a decade (MacRoberts & MacRoberts 1988, 1993b). It is also reported from Ouachita and St. Tammany parishes (Natural Heritage 1994).

*Lyonia mariana* (L.) D. Don. (*Latimore Smith s.n.* [LSU]). Staggerbush lyonia, an eastern species that reaches its western limit in east Texas, is known from one site on the CnyD (Claiborne Parish, T2N R4W Sec. 13). It has also been found in Caddo Parish (Natural Heritage 1994).

*Maianthemum racemosum* (L.) Link [SY = *Smilacina racemosa* (L.) Desf.]. (*Thieret 24686* [LAF]). There is only one known occurrence of False solomon seal, a northern species, on the KNF (Thieret 1967a). This species has been repeatedly searched for at the original site (CnyD, Claiborne Parish, T22N R4W Sec. 10) but without success. It occurs in mixed hardwood slope forest. This is the only parish for which this species has been reported (Natural Heritage 1994).

*Malaxis unifolia* Michx. (*MacRoberts & MacRoberts 341* [VDB]). We have found Green adder's mouth, a Louisiana Natural Heritage watch list species, at several scattered locations on the KD and WD, Natchitoches and Winn parishes. There has been no systematic survey for it. It is never common where found and appears to prefer shaded areas in mixed hardwood-loblolly forest, often under dogwood (*Cornus florida* L.). Its secretive habit and short stature may account for its apparent rareness. It has been found in many parishes in northern and southeastern Louisiana (MacRoberts 1989; Thomas & Allen 1993a).

*Mayaca fluviatilis* Aubl. [SY = *Mayaca aubletii* Michx.]. (*Hampsten et al. s.n.* [SFRP]; *MacRoberts & MacRoberts 2160, 2466* [VDB]). Bog moss, a coastal plain species, is known only from the ED (Rapides Parish). A survey for this species in 1993 revealed six ED locations (T3N R2W Secs. 17, 18, 20; T3N R3W Secs. 24, 25). It occurs in shallow water in bayhead swamps. It is also reported from southeastern Louisiana in St. Tammany, Tangipahoa, and Washington parishes (Natural Heritage 1994).

*Monotropa hypopithys* L. (*Rhodes 14856* [LTU]; *Carr & Bruser s.n.* [SFRP]). American pinesap, a widespread northern species, has been found in several locations in northern Louisiana, but only three are on the KNF. Two are on the CnyD (T22N R4W Sec. 10; T23N R4W Sec. 34) in Claiborne Parish, and one is on the WD in Winn Parish (T11N R5W Sec. 13). One of the CnyD populations has not been relocated in recent years. It grows in shortleaf pine/oak-hickory forest and mixed hardwood loblolly forest in filtered shade (Larke & Smith 1994). It is found in a number of parishes on the northern tier of Louisiana (Natural Heritage 1994).

*Obolaria virginica* L. (*Carr, MacRoberts, & MacRoberts 2168* [VDB]; *MacRoberts & MacRoberts 2254* [SFRP]). Pennywort is on the Louisiana Natural Heritage watch list. We have encountered it only twice on the Kisatchie National Forest in deeply shaded hardwood slope forest (ED, Rapides Parish, T2N R3W Secs. 11, 12). How common it may be is not known since very little surveying has been done in mixed hardwood slope forest. It is known from a number of north Louisiana parishes (MacRoberts 1989).

*Orobanche uniflora* L. (*McInnis 3990* [personal collection]). Broomrape, a widespread northern species that also occurs in Texas and Arkansas, was first reported for Louisiana in 1852 (MacRoberts 1984, 1989). But it was not reported again until 1990 when it was found in upland longleaf pine forest on the VD (Vernon Parish,

T1N R8W Sec. 36) (Hart & Lester 1993). It has also been reported for Rapides Parish (Natural Heritage 1994).

*Panicum flexile* (Gatt.) Scribn. (*Brown & Lenz* 8236 [LSU]; *Smith & Gilmore* 3713 [LSU]; *Thomas & Allen* 94224 & 13430 [NLU]). Wiry witchgrass, a widespread eastern species that is uncommon at most localities where it occurs, is recorded from four calcareous prairies in the WD (Winn and Grant parishes, T9N R2W Sec. 5; T11N R4W Sec. 18; T11N R5W Secs. 13, 26) (Smith *et al.* 1989; Allen 1992). It has also been reported for Caddo, Ouachita, and Vernon parishes (Natural Heritage 1994).

*Paronychia drummondii* Torrey & A. Gray. (*MacRoberts & MacRoberts* 2083 [VDB], 2281, 2344 [SFRP], 1805 [LSU]). Drummond's nailwort, a Texas near endemic that reaches its eastern limit in western Louisiana, is known from eight locations on the WD (Natchitoches Parish, T12N R5W Sec. 8; T31N R6W Secs. 7, 12, 18; T13N R7W Secs. 2, 11; Winn Parish, T12N R5W Sec. 28; T13N R5W Sec. 17). It occurs in upland and stream terrace xeric sandhill woodlands. It has also been recorded from Bienville and Caddo parishes (Natural Heritage 1994).

*Pediomelum hypogaeum* (Nutt. ex Torrey & A. Gray) Rydb. [SY = *Psoralea subulata* Bush]. (*MacRoberts & MacRoberts* 2236 [LSU, VDB, SFRP, NLU]). Awl-shaped scurf-pea occurs in east Texas, south Oklahoma, southwest Arkansas, and western Louisiana (Lasseigne 1973). It has been found at one location on the KD (Natchitoches Parish, T7N R7W Sec. 36) in upland xeric sandhill woodlands. It also has been found in Caddo Parish (Natural Heritage 1994).

*Penstemon murrayanus* Hook. (*MacRoberts & MacRoberts* 1612 [VDB]; *Grelen* 2052 [SFRP]). The only known KNF site of cupleaf beardtongue is in a stream terrace sandhill woodland in an inholding on the WD (Winn Parish, T12N R5W Secs. 28, 29). This species is found in Arkansas, Oklahoma, Texas, and in northwestern Louisiana (Vincent 1982) where it has been found in Caddo Parish (Natural Heritage 1994).

*Phacelia strictiflora* (Engelm. & A. Gray) A. Gray. (*MacRoberts & MacRoberts* 2211 [VDB], 2532 [SFRP]; *Thomas & Kessler* 75762 & 1334 [NLU]). Phacelia, a species of the south central U.S., is known from two WD stream terrace sandhill woodlands (Winn Parish, T13N R5W Secs. 32, 33; T12N R5W Sec. 28) (Thieret 1967a). It has also been recorded for Caddo, Natchitoches, and Bienville parishes (Natural Heritage 1994).

*Platanthera blephariglottis* (Willd.) Lindl. White-fringed orchid, an eastern species, was first found as a single stem on the VD (Vernon Parish) in August 1990 (Parker 1990). In September 1992, the site was revisited and three stems were found at two locations. It occurs in T1N R6W Sec. 14 in bog habitat. The species has not been collected (although it has been photographed) because there were too few individuals (MacRoberts & MacRoberts 993b; Hart & Lester 1993). It is also reported from St. Tammany Parish (Natural Heritage 1994).

*Platanthera integra* (Nutt.) A. Gray ex Beck. (*MacRoberts & MacRoberts* 1146 [VDB], 886 [SFRP]). Yellow fringeless orchid, a coastal plain bog species, was unknown on the KNF until 1980 (Holmes 1983). It was known from only one site until systematic bog surveys revealed it at nine KD (Natchitoches Parish, T6N R7W

Secs. 11, 14, 22, 24, 25, 35, 36; T5N R8W Sec. 36) and twelve VD bogs (Vernon Parish, T1N R5W Sec. 33; T1N R6W Secs. 14, 15, 17, 23, 26, 35; T1N R7W Secs. 21, 28; T1S R8W Secs. 14, 15, 17, 20, 21) (MacRoberts & MacRoberts 1988, 1990a, 1990b, 1991, 1993b; Hart & Lester 1993). Its range is New Jersey to Florida and along the Gulf Coastal Plain to Texas, where it is very rare (Bridges & Orzell 1989a; Orzell 1990; Grace 1993). In Louisiana it is also reported from Beauregard and St. Tammany parishes (Natural Heritage 1994).

*Polanisia erosa* (Nutt.) Iltis. (MacRoberts & MacRoberts 1802 [VDB], 2340, 2431. [SFRP], 1821 [LSU]). Clammy weed, a species apparently confined to Texas, Oklahoma, Arkansas, and western Louisiana, has been found at four sites in upland and stream terrace xeric sandhill woodlands in the KD (Natchitoches Parish, T6N R7W Secs. 5, 12; T7N R7W Secs. 29, 36), and three sites on the WD (Winn and Natchitoches parishes, T12N R5W Sec. 28; T13N R6W Sec. 7) (MacRoberts & MacRoberts 1994). It has also been reported from Bienville and Sabine parishes (Natural Heritage 1994).

*Polygala verticillata* L. (MacRoberts & MacRoberts 1975 [VDB], 1968, 2363 [SFRP], 1666 [LSU]). Prairie milkwort is on the Louisiana Natural Heritage watch list. It has not been monitored on the KNF. While often difficult to find because of its small size, we have found it regularly in sandstone outcrop and calcareous prairie communities in Natchitoches and Winn parishes (KD and WD) (MacRoberts & MacRoberts 1993c). It appears to be scattered widely around the state (MacRoberts 1989).

*Polygonella americana* (Fisch. & C.A. Mey.) Small. (MacRoberts & MacRoberts 1799 [VDB], 2428 [SFRP]). Southern jointweed, a species found in xeric sandylands from South Carolina to New Mexico, occurs at one xeric stream terrace sandhill woodland in an inholding on the WD (Winn Parish, T12N R5W Sec. 28). It has also been recorded from Bienville, Caddo, and Sabine parishes (Natural Heritage 1994).

*Polygonella polygama* (Vent.) Engelm. & A. Gray. (MacRoberts & MacRoberts 2128 [VDB], 920, 2147 [SFRP]; Gilmore, Smith, & Johnson 3729 [NLU]). October flower, an upland xeric sandhill woodland plant, was first found in Louisiana in 1988 on the WD (Natchitoches Parish, T13N R6W Secs. 7, 18) where it is abundant (Johnson & Johnson 1990). However, it is not known from any other locality in Louisiana. It ranges across the southern U.S. from Virginia to Texas.

*Polytaenia nuttallii* DC. (MacRoberts & MacRoberts 2377 [SFRP]; Thomas *et al.* 92238, 104893 [NLU]). Prairie parsley is on the Louisiana Natural Heritage watch list. It has not been specifically monitored so records are not available, but it occurs in several calcareous prairies on the WD (Winn Parish) (Smith *et al.* 1989). It occurs in several scattered locations in western and central Louisiana (MacRoberts 1989).

*Prenanthes barbata* (Torrey & A. Gray) Milstead. (MacRoberts & MacRoberts 2082 [VDB]; Thomas 78298 [SFRP]). Barbed rattlesnake-root, a southeastern species, is found in mixed hardwood-loblolly and riparian forest. It has been found at nine locations on the WD (Winn Parish, T13N R5W Secs. 2, 3, 4, 9, 10, 14, 15, 22, 24; Natchitoches Parish, T13N R6W Sec. 1), and one location on the ED (Rapides Parish, T3N R2W Sec. 29) (Gandhi & Thomas 1989). It is also reported from Vernon Parish (Natural Heritage 1994).

*Pteroglossaspis ecristata* (Fernald) Rolfe. [SY = *Eulophia ecristata* (Fernald) Ames]. (Thomas *et al.* 12265 [NLU]). Wild coco, a southeastern species, is known from only one site in the KNF. This is a wooded seep in the CatD (Grant Parish, T8N R1W Sec. 11) (Thomas 1972). Although found in the late 1960's, it has not been regularly monitored. It was apparently found at this location again in 1978 but not relocated in a 1986 survey. We did not relocate it in our survey of the site in 1994. It has also been recorded for Allen, Beauregard, Jefferson Davis, St. Tammany, Tangipahoa, and Washington parishes (Natural Heritage 1994).

*Rhynchospora macra* (C.B. Clarke) Small. (MacRoberts & MacRoberts 1432, 1469 [VDB], 1430, 1467 [SFRP], 1464, 1494 [NLU], 1434, 1787 [LSU]). Large beakrush, a coastal plain species that reaches the periphery of its range in the WGCP, was first found in Louisiana in the early 1970's in a bog on the KD. This remained the only known WGCP site until extensive bog surveys on the VD and KD in the late 1980's and early 1990's located it in eight KD (Natchitoches Parish, T5N R8W Sec. 3; T6N R6W Sec. 34; T6N R6W Secs. 11, 17, 22) and 22 VD (Vernon Parish, T1S R6W Sec. 6; T1S R7W Secs. 2, 3; T1S R8W Secs. 1, 13, 20, 21; T1N R5W Sec. 28; T1N R6W Secs. 13, 14, 15, 17, 20, 21, 22, 23, 24) bogs (MacRoberts & MacRoberts 1988, 1992, 1993b; Buras 1993; Hart & Lester 1993). It has not been reported from any other parishes in Louisiana.

*Rhynchospora oligantha* A. Gray. (MacRoberts & MacRoberts 956 [LSU], 701, 769, 924 [VDB], 934, 1259 [SFRP]). This bog fidel is on the Natural Heritage watch list. We have found it to be abundant in most bogs in the WD; KD, and VD (Vernon and Natchitoches parishes). Thomas & Allen (1993a) also report it from Beauregard and Allen parishes.

*Rudbeckia laciniata* L. (MacRoberts & MacRoberts 2468 [SFRP]). Goldenglow, a watch list species, is known from one riparian woodland on the ED (Rapides Parish, T3N R2W Secs. 28, 29). It is also reported from Caddo, Evangeline, West Feliciana, and Washington parishes (MacRoberts 1989; Gandhi & Thomas 1989). Gandhi & Thomas (1989) state that *R. laciniata* is cultivated and can escape. Whether or not the population in Rapides Parish is natural is not known.

*Rudbeckia scabrifolia* L.E. Brown. (MacRoberts & MacRoberts 859, 1686, 1747 [VDB], 1468, 1748, 2331 [SFRP]). Sabine coneflower, a recently recognized WGCP endemic (Brown 1986), has been found in about 50 VD (Vernon Parish) bogs and baygalls (there are so many sites that we do not give locations except to point out that the species appears to be confined to the western half of the VD). It also occurs in two WD (Winn and Natchitoches parishes, T13N R5W Sec. 9; T13N R7W Sec. 2) sites; one is a bog, the other a wooded seep (Bridges & Orzell 1989a; MacRoberts & MacRoberts 1993b; Hart & Lester 1993; Orzell 1990). It has also been recorded from Sabine Parish (Natural Heritage 1994).

*Sabatia macrophylla* Hook. (MacRoberts & MacRoberts 1722 [VDB], 1704 [SFRP]; Grelen & Thomas 1780 [SFRP]). Large-leaved rose gentian, a coastal plain species that reaches the limit of its range in the WGCP, has been found in about 50 VD (Vernon Parish) bogs. Since these are scattered over the entire district, we do not give precise locations (MacRoberts & MacRoberts 1993b; Hart & Lester 1993). It has also

been reported for Beauregard, St. Tammany, and Washington parishes (Natural Heritage 1994).

*Schoenolirion croceum* (Michx.) Wood. (*MacRoberts & MacRoberts 1586* [VDB], 1920 [SFRP]). Yellow sunny-bells is on the Louisiana Natural Heritage watch list. It has not been monitored on the KNF. It is abundant in some, but by no means all, bogs on the VD (Vernon Parish). It has been reported from Beauregard, Natchitoches, and Sabine parishes (*MacRoberts & MacRoberts 1993b*; Thomas & Allen 1993a).

*Schoenolirion wrightii* Sherman. (*MacRoberts & MacRoberts 1901* [VDB], 1914 [LSU,NLU], 1914, 1921 [SFRP]). Texas sunny-bells was first found on the KNF in 1993 on sandstone outcrops. A survey of nineteen outcrops located it in five. At one site up to 1000 plants were found. All sites are on the KD (Natchitoches Parish, T6N R8W Secs. 27, 28, 29, 32; T6N R7W Sec. 35) where the plant grows on unshaded thin soils on open rock pavement. In the KNF, Texas sunny-bell is always associated with *Talinum parviflorum* Nutt. (*MacRoberts & MacRoberts 1993c*). The species has an unusual distribution of disjunct populations from Alabama, Arkansas, Louisiana, and Texas (Nixon & Ward 1981; Orzell 1990; Sherman & Becking 1991). These KNF populations may be some of the most protectable in the world. It has also been found in Red River Parish (Natural Heritage 1994).

*Selaginella arenicola* Underw. subsp. *riddellii* (Van Eselt.) R. Tryon. (*MacRoberts & MacRoberts 1809* [VDB], 1779 [SFRP]; *Thomas & Kessler 75765 & 1337* [SFRP]). Riddell's spikemoss has been known since the middle of the last century from areas now probably part of the KNF (Brown & Correll 1942; Thieret 1980). On the KD, it is known from nine sites (Natchitoches Parish, T6N R6W Sec. 21; T6N R7W Sec. 5; T6N R8W Secs. 27, 29, 32, 35, 36; and T7N R7W Sec. 36) (*MacRoberts & MacRoberts 1994*). It occurs in two communities: sandstone outcrops, and upland and stream terrace xeric sandhill woodland. In the former, it grows on sandstone pavements (*MacRoberts & MacRoberts 1993c*), in the latter in deep xeric sands. On the WD (Natchitoches and Winn parishes) it is known from three sites in sandy woodlands (T13N R6W Sec. 7; T13N R5W Sec. 32; T12N R5W Sec. 28). This is a coastal plain species that is rare in the WGCP. It has also been reported from Bienville, Caddo, Sabine, and Vernon parishes (Natural Heritage 1994).

*Solidago auriculata* Shuttlw. ex S.F. Blake. (*MacRoberts & MacRoberts 2498* [SFRP], 2495, 2496 [NLU], 2497 [LSU]). Clasping goldenrod is a Louisiana Natural Heritage watch list species that is sometimes abundant in mixed hardwood slope forest. We have found it at several locations on the KD (Natchitoches Parish). It has also been reported from several northwestern parishes (Gandhi & Thomas 1989).

*Sporobolus ozarkanus* Fernald. (*Gilmore & Smith s.n.* [NLU]; *McInnis & Smith 3695* [LSU]). Ozark dropseed has been found at one calcareous prairie in the WD (Winn Parish, T11N R4W Sec. 18; T11N R5W Sec. 13) (*Smith et al.* 1989). It also occurs in Missouri, Arkansas, and Texas. It has yet to be reported from any other parish in Louisiana (Natural Heritage 1994; Allen 1992).

*Stenanthium gramineum* (Ker-Gawl.) Morong. (*MacRoberts & MacRoberts 737* [VDB], 811, 1724 [SFRP]). Featherbells is a Louisiana Natural Heritage watch list

species. We have found it in several communities on the KD (Natchitoches Parish), often in large numbers, specifically in damper areas of upland longleaf pine forest and in riparian forest. It has also been reported from Beauregard, Caddo, Red River, Sabine, St. Tammany, Washington, and Winn parishes (Thomas & Allen 1993a).

*Streptanthus hyacinthoides* Hook. (*MacRoberts & MacRoberts* 2298 [VDB], 2332, 2347 [SFRP]). Smooth twistflower occurs in upland and stream terrace xeric sandhill woodlands at two locations on the WD (Winn Parish, T13N R5W Sec. 32; T12N R5W Sec. 28) and one location on the KD (Natchitoches Parish, T7N R7W Sec. 36). It is also found in Bienville and Caddo parishes (Natural Heritage 1994), and in Arkansas, Texas, and Oklahoma.

*Stylisma aquatica* (Walt.) Raf. (*MacRoberts & MacRoberts* 1696 [SFRP]). *Stylisma* is on the Louisiana Natural Heritage watch list. We know it from only one site on the VD (Vernon Parish). It was found in an open mesic area just above a bog in conjunction with *Viola lanceolata* L. and *Calopogon barbatus*. It appears to be scattered around the state (MacRoberts 1989).

*Taenidia integerrima* (L.) Drude. (*MacRoberts & MacRoberts* 2180 [VDB], 2372 [SFRP]). Yellow pimpinell is an eastern species that is rare in the WGCP. It has been found at three locations on the WD (Natchitoches and Winn parishes, T13N R6W Sec. 32; T11N R4W Sec. 18) where it occurs in riparian calcareous forest (Larke & Smith 1994). It is also reported from Bienville, Caddo, and Caldwell parishes (Natural Heritage 1994).

*Talinum parviflorum* Nutt. (*MacRoberts & MacRoberts* 1759, 1780 [VDB], 2056 [SFRP], 1493, 1758 [LSU]). Small-flowered flame flower, a Great Plains species, was known from only a few sites on the KD (Natchitoches Parish) since the 1930's. A survey of sandstone outcrop communities in 1992 and 1993 located it at 24 sites scattered over the southern half of the KD (T5N R6W Secs. 4, 5, 25, 33; T5N R7W Sec. 6; T5N R8W Sec. 1; T6N R8W Secs. 26, 28, 29, 32, 35, 36). It grows, often in large number (> 1000), in full sun almost exclusively in thin soils in slight depressions on flatrock pavements (MacRoberts & MacRoberts 1993c; Thieret 1969). It also is recorded from Caddo, Red River, Sabine, and Winn parishes (Natural Heritage 1994).

*Tetragonotheca ludoviciana* (Torrey & A. Gray) A. Gray ex Hall. (*MacRoberts & MacRoberts* 1988 [VDB], 1691 [SFRP], 2371 [LSU]). There are six known locations for Louisiana square-head, a WGCP endemic, on the KD (Natchitoches Parish, T6N R7W Secs. 1, 2, 5, 9, 17), and one on the VD (Vernon Parish, T1N R7W Sec. 22) (Hart & Lester 1993). It grows in upland xeric sandhill woodlands (Grace 1993; Gandhi & Thomas 1989; Turner & Dawson 1980). It has also been reported from Allen, Caddo, and Sabine parishes (Natural Heritage 1994).

*Tradescantia reverchonii* Bush. (*MacRoberts & MacRoberts* 1565 [VDB], 2276, 2407 [SFRP]). This species is on the Louisiana Natural Heritage watch list. It is found almost exclusively in upland and stream terrace xeric sandhill woodlands of western Louisiana and eastern Texas south to the Rio Grande Valley. It is common in all sandylands in both the KD and WD (Natchitoches and Winn parishes). It appears to especially like disturbed areas (MacRoberts 1980). It has been reported from Caddo, Beauregard, Bienville, Sabine, and Vernon parishes (MacRoberts 1989).



*Triphora trianthophora* (Sw.) Rydb. (*MacRoberts & MacRoberts* 2509 [SFRP]). Three-birds orchid, a widespread eastern species, has been found only twice on the KNF, KD (Natchitoches Parish, T7N R7W Sec. 20) in "damp, shady woods" in September 1977 (Mathies *et al.* 1983; Holmes & Mathies 1980) and ED (Rapides Parish, T2N R3W Sec. 11) in hardwood slope forest in 1994. It has also been recorded for Caddo and West Feliciana parishes (Natural Heritage 1994).

*Utricularia juncea* Vahl. (*MacRoberts & MacRoberts* 825, 1179 [VDB], 872 [SFRP], 1442 [LSU]). This bladderwort is on the Louisiana Natural Heritage watch list. It is locally common in bogs on the KD and VD (Natchitoches and Vernon parishes) (*MacRoberts & MacRoberts* 1988). It has also been reported from Beauregard, St. Tammany, and Washington parishes (*MacRoberts* 1989).

*Utricularia purpurea* Walt. Purple bladderwort is on the Louisiana Natural Heritage watch list. It has been reported from only one bog on the VD (Vernon Parish, T1N R6W Sec. 22), but there is no known voucher specimen (Parker 1990). It has been reported from Evangeline, Cameron, Tangipahoa, and St. Tammany parishes (*MacRoberts* 1989).

*Uvularia sessilifolia* L. (*McInnis* 4003, *s.n.* [personal collection]). Sessile-leaved bellwort, a northeastern species, known from the northern tier of Louisiana parishes, has been found at two locations on the VD (T1N R7W Secs. 13, 33) (Hart & Lester 1993) and one location on the WD (Natchitoches Parish, T13N R6W Sec. 8). It occurs in wooded seeps and bayhead swamps. It is also recorded from Caddo, Claiborne, Lincoln, Morehouse, Union, and Webster parishes (Natural Heritage 1994).

*Xanthorhiza simplicissima* Marsh. (*Allen* 14892; *Thomas & Allen* 98050 [NLU]). Yellowroot, a southeastern species that is rare in the WGCP, was first found in Louisiana on the VD (Vernon Parish) in 1986 and has subsequently been found at another location about three miles away (T1N R7W Sec. 34 and T1S R8W Sec. 1) (*Allen et al.* 1987; Buras 1993; Hart & Lester 1993). It favors shaded riparian forest sites. These are the only locations reported in Louisiana (Natural Heritage 1994).

*Xyris drummondii* Malme. (*MacRoberts & MacRoberts* 868, 885 [VDB], 1158, 1775A [SFRP], 841, 1775B [NLU], 1781, 1841 [LSU]). Drummond's yellow-eyed grass, a coastal plain species, was first reported for the WGCP in the mid-1970s from a bog in the KD (Natchitoches Parish, Kral 1983). Surveys of bogs on the KNF since the late 1980's have located it in about 75 bogs on the KD and VD (Natchitoches and Vernon parishes, Hart & Lester 1993, *MacRoberts & MacRoberts* 1988, 1990a, 1991, 1992, 1993b) It is so widespread in these two districts that we will not give locations. It is also known from many other bogs in western Louisiana and eastern Texas (Bridges & Orzell 1989a; Orzell 1990). It is also found in Beauregard Parish (Natural Heritage 1994).

*Xyris scabrifolia* Harper. (*MacRoberts & MacRoberts* 1491, 1543 [VDB], 1448, 1793 [SFRP], 1754, 1782 [NLU]). Rough-leaved yellow-eyed grass, an uncommon coastal plain species, was first reported for the WGCP in the early 1980s. It has been found in sixteen bogs scattered widely over both the KD (Natchitoches Parish, T5N R8W Sec. 3; T6N R7W Secs. 12, 21, 22; T6N R8W Sec. 35) and VD (Vernon

Parish, T1S R8W Secs. 12, 14; T1N R5W Sec. 28; T1N R6W Secs. 14, 20, 21, 23, 25; T1N R7W Sec. 29; T1N R8W Secs. 1, 34) (MacRoberts & MacRoberts 1992, 1993b; Bridges & Orzell 1989a; Hart & Lester 1993). It also occurs in Beauregard Parish (Natural Heritage 1994).

*Zigadenus densus* (Desr.) Fernald. (*MacRoberts & MacRoberts* 1646 [VDB], 1966 [SFRP], 1646 [LSU]; *Hampsten s.n.* [SFRP]). While black snakeroot and other *Zigadenus* species have been reported from Louisiana for a long time, there has been confusion over taxonomic status and distribution (Thieret 1972). *Zigadenus densus* is a coastal plain species. During surveys in 1992 and 1993, it was found in fifteen VD bogs (Vernon Parish, T1N R5W Secs. 28, 30, 31, 32; T1N R6W Secs. 21, 23; T1N R7W Secs. 24, 25, 27; T1N R8W Secs. 15, 22) (MacRoberts & MacRoberts 1993b; Hart & Lester 1993). It is also reported from St. Tammany and Washington parishes (Natural Heritage 1994).

*Zornia bracteata* J.F. Gmel. (*MacRoberts & MacRoberts* 1897 [VDB], 1807, 2413 [SFRP]). *Viperina*, a southeastern species, occurs in a stream terrace sandhill woodland at one inholding on the WD (Winn Parish, T12N R5W Secs. 28, 29) (Lasseigne 1973). It has also been reported for Caddo, Natchitoches, Vernon, and Tangipahoa parishes (Natural Heritage 1994).

#### EXCLUDED SPECIES

Two species that have been on the KNF rare species list have not been verified. One is *Xyris stricta* Chapman reported from several localities on the VD (Vernon Parish, and from southern Natchitoches Parish) (Hart & Lester 1993). The voucher specimens for these reports turn out to be other *Xyris* species (Linda Watson and Bruce Hoagland, pers. comm.). The other is *Asclepias hirtella* (Pennell) Woodson reported for the KD (Natchitoches Parish). After repeated searches, the voucher specimen for this has been located and it turns out to be *A. longifolia* Michx. (S. Lynch, pers. comm.).

#### DISCUSSION

The Kisatchie National Forest comprises about two percent of the Louisiana land surface. The 1994 Louisiana Natural Heritage rare species and watch lists contain 407 species. Eighty, or 20%, of these have been found on the KNF. The Natural Heritage has 2071 rare plant species site records for the entire state (Julia Larke, pers. comm.). Add to this many records from the KNF not yet in their data base, and the figure probably approaches 2500. There are about 570 rare species site records for the KNF. The KNF therefore accounts for about 23 percent of the Louisiana total. Relatively speaking, therefore, the KNF is either very rich in rare species sites or has been exceptionally well surveyed. The latter, of course, is the case largely because it is open to investigation, because it has relatively vast tracts of undisturbed habitat, and because several community types within it have been the subject of special surveys.

Comparing these records with what was known about these species in the WGCP ten years ago makes it obvious that while much work has been done, much remains to be done in documenting the flora of the WGCP (Bridges & Orzell 1989a: 63). For

example until two decades ago, *Xyris drummondii* was not known to occur in the WGCP, and for years after its discovery it was known from only one bog. Recent surveys of bogs in west Louisiana and east Texas have found it in over 100 locations (Bridges & Orzell 1989a; Orzell 1990; MacRoberts & MacRoberts 1993b; Hart & Lester 1993), its highest known concentration. *Rudbeckia scabrifolia* was not recognized as a separate species until 1986 (Brown 1986). Due to intensive bog surveys, it too has now been documented from over 100 WGCP bogs and baygalls (Bridges & Orzell 1989a; Orzell 1990; MacRoberts & MacRoberts 1993b; Hart & Lester 1993; Parker 1990).

The same applies to community types. A concerted effort is currently under way to negotiate a taxonomy of community types for the WGCP (Smith 1988, in prep.; Diamond *et al.* 1987; Bridges & Orzell 1989b; Orzell 1990; Martin & Smith 1991, 1993), but as more research is undertaken, it is clear that these taxonomies are preliminary.

At the same time, we are only beginning to map the extent and location of different communities. Surveys of major community types, as well as those of inclusion communities, are beginning to uncover the distribution, extent, and condition of these rare, localized, and specialized habitats where rare plants often occur in surprising abundance. Unfortunately, progress is slow since, in the entire WGCP, only a handful of botanists and ecologists are working.

#### ACKNOWLEDGMENTS

The continuing cooperation and assistance of the staff of the Kisatchie National Forest was instrumental in making this work possible. Especially to be thanked are Susan Carr, Ken Dancak, Karen Belanger, Tom Fair, and John Baswell. Part of our research was sponsored by volunteer and cost-share agreements. Part of our survey work on the Vernon District was conducted while on contract with The Nature Conservancy. We wish to thank the Louisiana Natural Heritage Program, Louisiana Department of Wildlife and Fisheries, and The Nature Conservancy, for sharing with us their information about rare WGCP plants. In 1994 some of the data were gathered while the authors were on contract with the Forest Service ("Sensitive Plant Survey", #RFQ R8-6-94-417). We wish to thank the Forest Service for allowing us to publish that data. Robert Kral, Will McDearman, Steve Orzell, Steve Lynch, and Julia Larke vetted a number of difficult species. Julia Larke, Latimore Smith, and Nelwyn McInnis supplied much information concerning rare species and Louisiana ecology. D.T. MacRoberts, Julia Larke, Latimore Smith, Phil Hyatt, and Rhonda Stewart made useful comments on the manuscript. Many others aided in various ways, notably Dale Thomas, Don Rhodes, Steve Lynch, Rhonda Stewart, and Charles Allen, Robert Kral, Tom Wendt, Steve Lynch, Linda Watson, D.T. MacRoberts, David Moore, and Bruce Hoagland were especially helpful in clearing up some problematic items. Since people, not institutions, found and recorded these plant locations, thanks are due the individuals who searched for these plants and who were sedulous enough to make collections and/or see that their findings get into a centralized data base -- either of the Louisiana Natural Heritage Program or the Kisatchie National Forest -- or into a herbarium or into print.

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